# COMMONWEALTH ELECTRIC COMPANY d/b/a NSTAR ELECTRIC
## Direct Testimony of James H. Aikman
### D.T.E. 01-25

1 **Q. Please state your name, address, and business affiliation.**

2 A. My name is James H. Aikman.  My business address is P. O. Box 201, Reading,

3 Pennsylvania 19603.  I am Vice President of Management Resources International, Inc.

4 ("MRI").

5 **Q. Please describe Management Resources International, Inc.**

6 A. MRI was formed in 1984 and is the successor to the Management Consulting Division

7 of Gilbert Associates, Inc. ("GAI").  MRI provides services in the areas of

8 Depreciation, Valuation, Finance and Accounting, Planning and Management, and

9 Computer Management Services.

10 **Q. Will you please describe your education and business experience?**

11 A. I am a graduate of the University of Illinois from which I hold a Bachelor of Science

12 degree in Civil Engineering. I have worked in the area of depreciation since November,

13 1967, when I assumed a position on the engineering staff of the Missouri Public

14 Service Commission ("PSC").  During my employment with the PSC, I assisted in the

15 preparation of numerous depreciation rate studies and testified regarding depreciation

16 rates in two cases.  I joined Gilbert Associates in August, 1971.  Since that time, I have

17 worked on numerous depreciation rate studies for gas and electric utilities and I have

18 testified on depreciation matters in Arkansas, Connecticut, Georgia, Illinois, Iowa,

19 Kansas, Louisiana, Maine, Massachusetts, Missouri, New Hampshire, Ohio,

20 Pennsylvania, Rhode Island, South Carolina, the City of New Orleans, and Nova

1    Scotia, Canada.   Specifically, I have testified on depreciation in 30 cases in

2    Massachusetts.

3  **Q.  Are you a registered professional engineer?**

4  A.  Yes.  I am registered in the states of Illinois, Missouri, Pennsylvania and Virginia.

5  **Q.  Are you a member of any professional organizations?**

6  A.  Yes, I am a member of the American Society of Civil Engineers and the Society of

7    Depreciation Professionals.

8  **Q.  Please describe the duties and responsibilities of your current position.**

9  A.  As the depreciation specialist of our organization, I am currently Project Manager of

10    several depreciation rate studies. As Project Manager, I am responsible for planning

11    the studies, delineating and coordinating data collection, ensuring the accuracy of the

12    data and properly reflecting any accounting adjustments.  Beyond data collection, I am

13    responsible for the performance and interpretation of statistical analyses and the

14    preparation of appropriate schedules to reflect the results of the studies.

15  **Q.  What is the purpose of your testimony?**

16  A.  To support the position of Commonwealth Electric Company ("Commonwealth" or

17    the "Company") regarding the value of streetlights to be sold to three towns on Cape

18    Cod.

19  **Q.  Are you familiar with the definitions of depreciation applied by the Federal**
20  **Energy Regulatory Commission ("FERC") and the National Association of**
21  **Regulatory Utility Commissioners ("NARUC")?**

22  A.  Yes.  The two definitions are almost identical.  The definition of depreciation adopted

1    by NARUC is:

2          "Depreciation", as applied to depreciable electric (gas) plant, means the
3          loss in service value not restored by current maintenance incurred in
4          connection with the consumption or prospective retirement of electric
5          (gas) plant in the course of service from causes which are known to be in
6          current operation and against which the utility is not protected by
7          insurance.  Among the causes to be given consideration are wear and tear,
8          decay, action of the elements, inadequacy, obsolescence, changes in the
9          art, changes in demand, and requirements of public authorities (and in the
10         case of natural gas companies, the exhaustion of natural resources).

11    It is my understanding that the Massachusetts Department of Telecommunications and

12    Energy generally applies the same definition of depreciation.

13    **Q.**    **Did you prepare the depreciation accrual rate study upon which the current**
14          **accrual rates of Commonwealth are based?**

15    A.    Yes.  As a matter of fact, I have been involved in the preparation of depreciation

16          studies for the NSTAR operating electric and gas utilities since about 1975.

17    **Q.**    **Have all the studies been prepared on a similar basis?**

18    A.    Yes.  All the studies have been prepared upon a group depreciation basis;  as opposed

19          to a unit depreciation basis.

20    **Q.**    **Would you please explain the distinction between group and unit depreciation?**

21    A.    Certainly.  Unit depreciation  utilizes an estimated life of each unit of depreciable

22          property; _e.g._, a lathe, a welding machine, a pump, a pole, a meter, etc.  Group

23          depreciation involves the estimation of average service life for a group of units of

24          depreciable property; _e.g._, a plant account or subaccount, such as Street Lighting

25          Equipment.  The group depreciation methods employed are very much like those

26          methods employed by actuaries and used by life insurance companies to set rates.

1    In utility depreciation studies, the group is the vintage; i.e., the vintage-group method

2    is used.

3  **Q.   Why do utilities use group depreciation as opposed to unit depreciation?**

4  A.   Because it is impractical to maintain unit records of depreciation on hundreds of

5    thousands of depreciable property units.  It is impractical to estimate the life of every

6    unit of property.

7  **Q.   Please elaborate upon differences between unit and group depreciation.**

8  A.   With group depreciation, one is not concerned with possible over- or under-

9    depreciation of a property unit which dies - is retired - at less than or more than the

10    estimated average life of the group.  The assumption is that the under-accrual relative

11    to the unit which retired at an age less than the group average life will be compensated

12    for by the units of the group which retire at ages greater than the group average life.

13    With unit depreciation, each individual unit of property is depreciated over its

14    estimated useful life and would require maintaining a depreciation reserve for each unit

15    and periodic updating of each useful life.  In practice, one of the few types of assets

16    that lends itself to unit depreciation are location-specific generating assets, where most

17    of the assets are expected to terminate on the same date.

1 **Q. Why is it not reasonable to assume that the estimated average life of the group is**
2 **a good estimate for any surviving unit when doing such calculations as theoretical**
3 **depreciation reserves and estimates of the unrecovered plant investment of group**
4 **property?**

5 A.  Because in group property we are dealing with frequency distributions, the simplest

6 of which is the normal distribution, sometimes called the bell-curve.  The retirement

7 frequency curve we are alluding to has age in years on the horizontal axis and number

8 retired on the vertical axis.  In the normal distribution, the average life (the peak of the

9 curve) is at the mid-point on the horizontal axis; i.e., half of the retirements occur

10 before (to the left of) average life and half occur after (to the right of) average life.

11 This means that the absolute longest-lived unit of the group will live to an age of twice

12 the average life.

13 If one uses the group average life as an absolute/unit life estimate, it is analogous to

14 saying that, if the average life for male humans is 72 years, then because a particular

15 male human is 72 years old, he will NOT survive to age 73 or more.  In reality,

16 because that male has lived to age 72 (and not died earlier), his total life expectancy

17 based upon a normal distribution is about 90 years; that is, the average remaining life

18 for the 72 year old survivor of a group with a 72 year average life is about 18 years.

19  I make no claim that the normal distribution is the correct curve for human males.

20 **Q. Do you have any citations from authoritative sources which support your**
21 **contention?**

22 A.  Yes.  The frequency distributions most commonly employed in this country and

23 Canada by depreciation experts are the "Iowa Curves."  These are standard curves for

1 which the necessary parameters are tabulated and published for ease of use and

2 communication.  The curves were developed in the late 1920's and early 1930's at Iowa

3 State University Engineering Research Institute.

4 Bulletin 155 from that institute, titled "Depreciation of Group Properties" states on

5 page 6 that "It is incorrect to estimate the accrued depreciation of group properties

6 from the ratio of the average age of the units in service to the average life of the

7 group."

8 **Q.** **What relevance does the quote have to the streetlight value issue at hand?**

9 A. The issue before the Department for each of the three towns seeking to purchase the

10 Company's streetlights is the unrecovered original cost of the streetlights, which is the

11 gross original cost less the accrued depreciation.

12 **Q.** **Given the foregoing, why don't we just subtract the Accumulated Provision for**
13   **Depreciation (the book reserve) from the gross original cost to get at the**
14   **unrecovered cost?**

15 A. Because Commonwealth maintains a book reserve value for each subaccount, but not

16 by individual town.  The Company does maintain the gross original costs by vintage

17 and by subaccount.  This means we must allocate the book reserve to the town and

18 vintage level.  The way that such an allocation is routinely done is to compute the

19 theoretical depreciation reserve at the level at which the book reserve is maintained.

20 In this instance, that level is the subaccount for the total Company.

1 **Q. Is it common to maintain the book reserve at such a high level?**

2 A. The most commonly maintained level is that required by the FERC, the plant

3 functional level; i.e., total Distribution Plant, total Transmission Plant, etc. That is, the

4 Company actually maintains the book reserve at much more detailed levels than is

5 required by FERC.

6 Because the average life estimates are developed using group depreciation methods,

7 the accrual rates developed are based on group depreciation and they implicitly assume

8 the property units that survive beyond average life will be over-depreciated to

9 compensate for those under-depreciated units which retired before they reached

10 average life.

11 **Q. What is wrong with the Towns' value estimate for the street lights?**

12 A. Their value is strictly a theoretical unrecovered plant investment, and, further, it is

13 based on an erroneous theoretical reserve concept/calculation.

14 **Q. Does the Cape Light Compact (the "Compact") methodology of computing the**
15 **unrecovered value of the street lights provide the Company full recovery of its**
16 **plant investment?**

17 A. It most certainly does not. The Compact's methodology violates the previously noted

18 Bulletin 155 citation:

19     It is incorrect to estimate the accrued depreciation of group properties from
20     the ratio of the average age of the units in service to the average life of the
21     group.

22 **Q. Does this complete your testimony?**

23 A. Yes.